

PROJECT 10073 RECORD CARD

1. DATE 18 November 1963		2. LOCATION New Paltz, N.Y.		12. CONCLUSIONS <input type="checkbox"/> Was Balloon <input type="checkbox"/> Probably Balloon <input type="checkbox"/> Possibly Balloon <input type="checkbox"/> Was Aircraft <input type="checkbox"/> Probably Aircraft <input type="checkbox"/> Possibly Aircraft <input checked="" type="checkbox"/> Was Astronomical Meteor <input type="checkbox"/> Probably Astronomical <input type="checkbox"/> Possibly Astronomical <input type="checkbox"/> Other <input type="checkbox"/> Insufficient Data for Evaluation <input type="checkbox"/> Unknown	
3. DATE-TIME GROUP Local _____ GMT 18/0905Z		4. TYPE OF OBSERVATION <input checked="" type="checkbox"/> Ground-Visual <input type="checkbox"/> Ground-Radar <input type="checkbox"/> Air-Visual <input type="checkbox"/> Air-Intercept Radar			
5. PHOTOS <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		6. SOURCE Civilains			
7. LENGTH OF OBSERVATION 5 Minutes		8. NUMBER OF OBJECTS 1		9. COURSE SE	
10. BRIEF SUMMARY OF SIGHTING White smoke like streak breaking into 300-400 pieces. Particles travelled through sky in V formation. Resembled ECHO or SPUTNIK. Dull faint sound of explosion. Speed estimated too fast for a/c. Observation duration 5 minutes. Estimated altitude above 50,000ft. Initial observation at 70 deg in South. Disappearing 10 deg elev in East.				11. COMMENTS No decay for 18 Nov. Evaluated as Meteor. Much conflicting data. Assume narrative of spk speed in excess of a/c indicates motion. Rather than duration (Is correct)	

Wooten, and Larry Smith together saw 26 Leonids and 20 sporadics from Florida, Alabama. The next morning a three-hour watch began at midnight, with 30 Leonids and 36 other meteors logged by the first two observers.

Carl McLelland, Jr., and Robert La Pierre watched on the night of November 16-17 from 9:00 p.m., Pacific standard time, until dawn. During this interval these Whittier, California, amateurs counted 178 meteors.

At Wooster, Ohio, William Werner and nine other members of the Wayne County Astronomical Society recorded 70 meteors during 3½ hours, beginning at 9:10 p.m. CST.

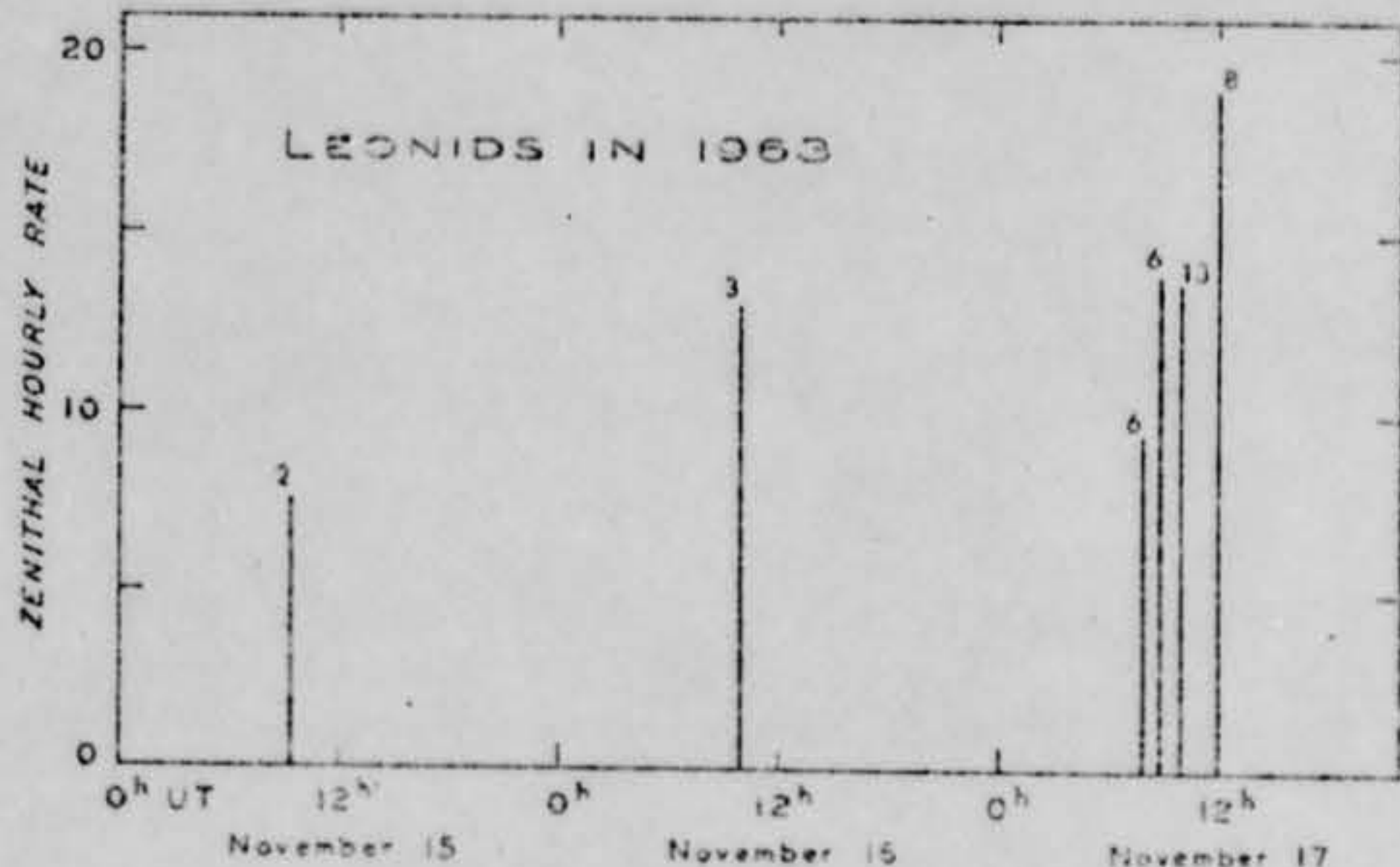
The number of Leonids an observer will count is larger the higher the radiant point is above the horizon. If the radiant were directly overhead, he could ex-

pect 10 percent more meteors than for an altitude of 60°, 30 percent more than at 45°, and 71 percent more than at 30°.

To make the tabulated counts of Leonids comparable, they must first be reduced to hourly rates, and then converted to zenithal rates. Counts made when the constellation Leo is too near the horizon cannot be safely converted.

Corrected rates, corresponding to the number of meteors that a single observer would see with the radiant in the zenith, are presented in this diagram. For simplicity, simultaneous data have been averaged. Note how the zenithal hourly rate climbed gradually to about 19 by 12^h UT on November 17th. No SKY AND TELESCOPE readers reported appropriate data for the following night, so it is uncertain from this sample just when peak activity of the meteor shower actually occurred.

The increase in richness of the Leonid shower during November 15-17 is shown by these corrected counts. The length of a bar represents the number of meteors that would have been seen in one hour with the radiant exactly overhead. With each bar is the number of individual determinations that were averaged together.



LUNAR LIBRATION CHART

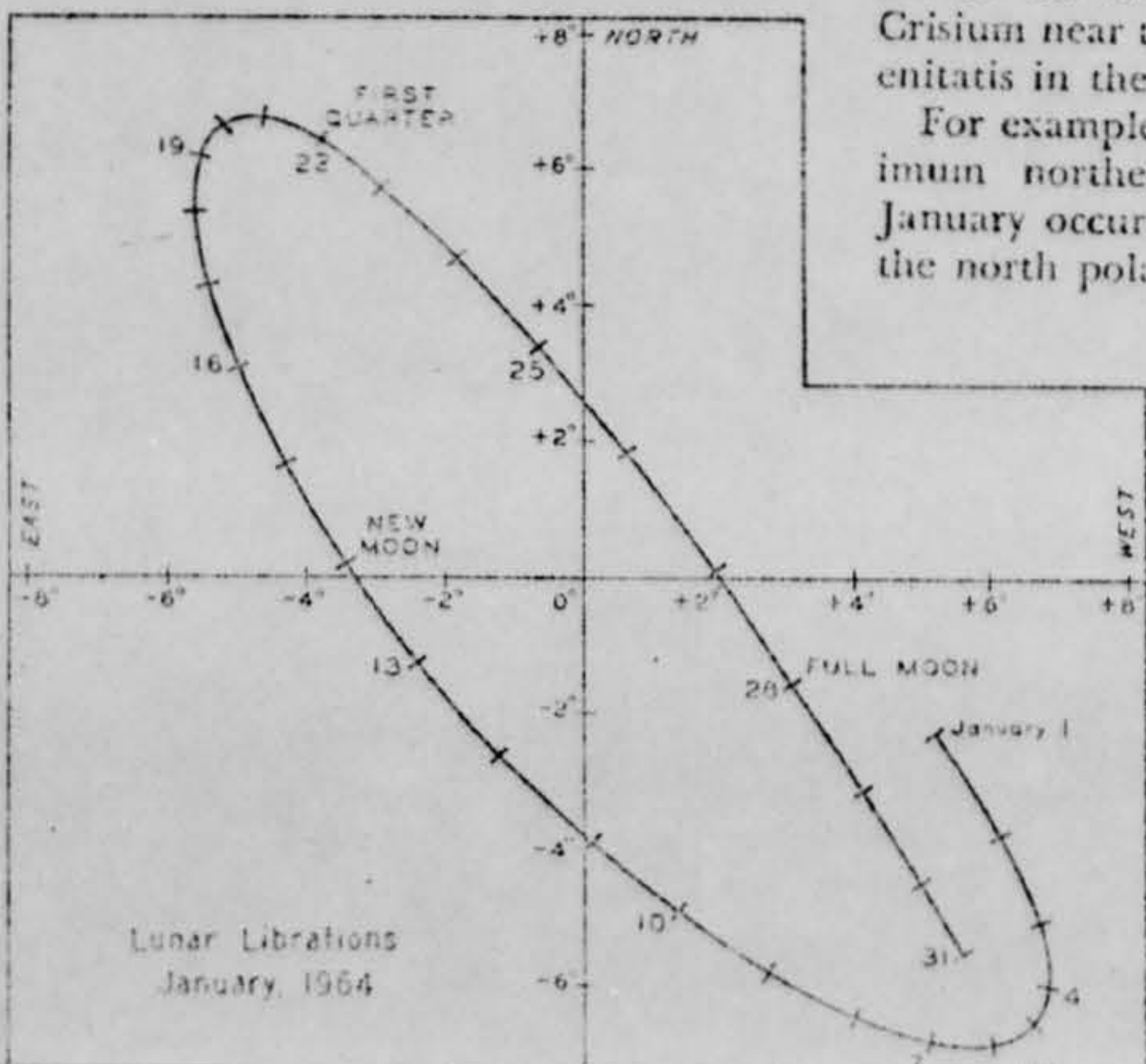
LIMB REGIONS are the least observed parts of the moon. Near the moon's edge some features are always visible, but greatly foreshortened; others are only intermittently carried into view by libration. This is the apparent monthly rocking of the moon in both north-south and east-west directions.

To predict when a particular portion

of the limb will be favorably tipped toward the earth during a month, I plot a chart like the one below. My information comes from the *American Ephemeris and Nautical Almanac*, where daily values are given for the earth's selenographic latitude and longitude (the lunar coordinates at the center of the apparent disk). Positive numbers indicate that the north or west limb is exposed. Directions are in the traditional sense, with Mare Crisium near the west limb and Mare Serenitatis in the northern hemisphere.)

For example, my chart shows that maximum northern libration (positive) in January occurs on the 21st. At this time the north polar region may be best seen.

ALIKA K. HERRING



The curved line in this chart by Alika K. Herring shows the moon's varying librations during January. Similar charts for other months can be plotted from information given in the "American Ephemeris."

Astronomy Films

16-mm. sound, 400-foot reels
I THE SUN; II THE MOON;
III SOLAR SYSTEM; IV MILKY WAY;
V EXTERIOR GALAXIES.

2 x 2 SLIDES

35-mm. STRIPS OF SLIDES

THROUGH 200-INCH AND
OTHER GREAT TELESCOPES

Catalogues on request.

International
Screen Organization

1445 18th Ave. North, St. Petersburg 4, Fla.

Precision Diagonals

You will get the best possible performance from your telescope with one of our clear FUSED QUARTZ diagonals. Accuracy guaranteed 1/20 wave.

Ellipse 1.25" x 1.77" . . . \$12.00
Ellipse 1.5" x 2.12" . . . \$15.00

PYREX-brand glass diagonals, 1/8-wave accuracy.

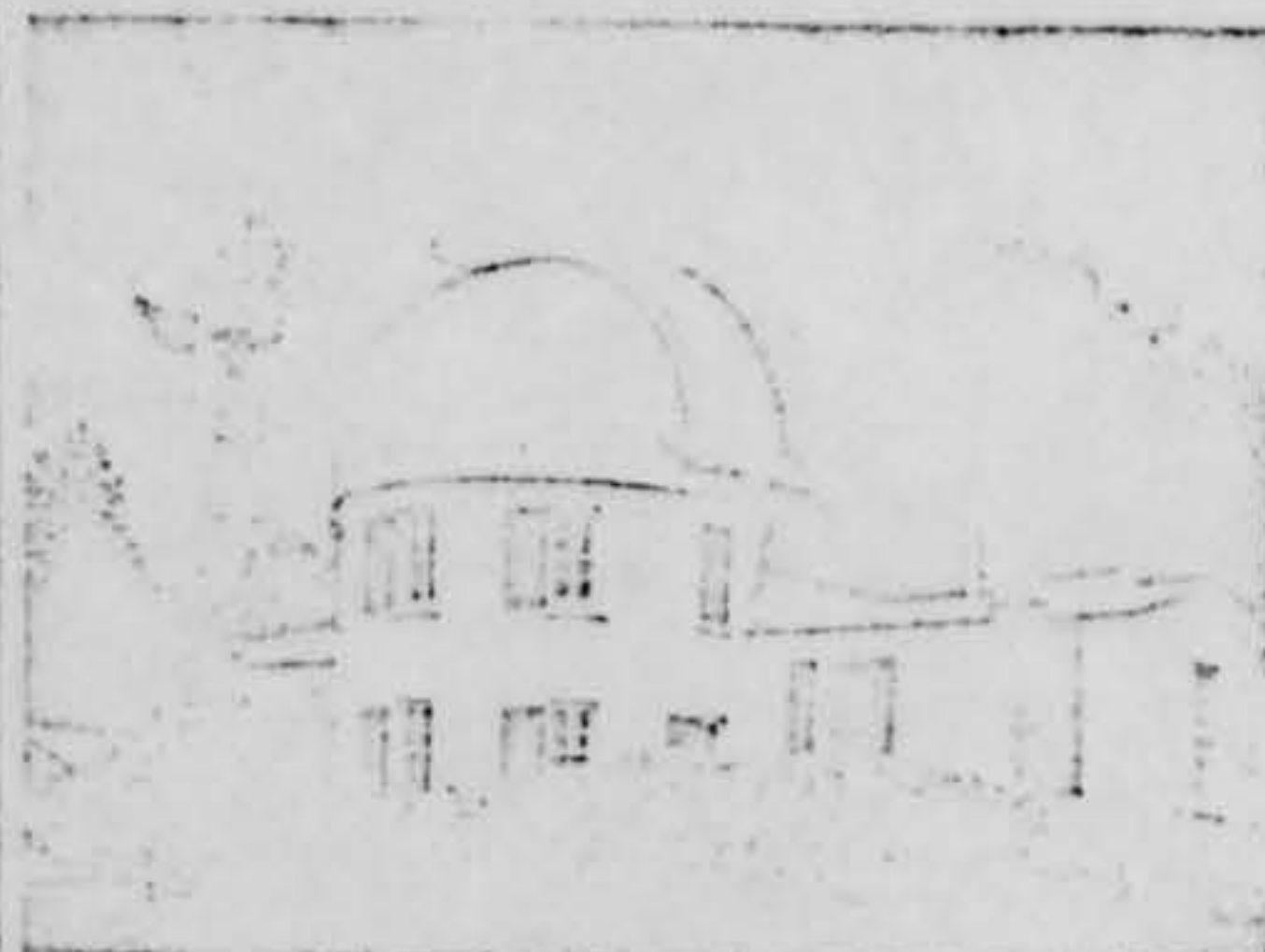
Ellipse 1.25" x 1.77" . . . \$ 6.00
Ellipse 1.5" x 2.12" . . . \$ 9.00

Without aluminum coating, deduct \$1.00.

Send for our NEW list of supplies,
quartz mirrors, blanks, oculars,
coatings, and accessories.

E & W OPTICAL CO.

2420 East Hennepin Ave.
Minneapolis 13, Minnesota



Dartmouth College, Shattuck Observatory
Hanover, New Hampshire

The original Shattuck Observatory was built in 1853-54 and was a sheet metal covered wooden dome. It was replaced by an all metal electrically operated Astro Dome with double transverse shutters. This Astro Dome houses and protects a 9.4" Alvan Clark refractor which was made in 1871 and remounted by Clark in 1910. It is utilized today in the teaching program of the observatory.

The meteorological observations carried out by the Observatory constitute the largest series of climatological observations in New Hampshire, with unchanged instrumental exposure since 1855. The present director is Dr. Richard H. Goddard.

This is typical of the many Astro Dome installations being utilized by both professional and amateur astronomers throughout the world.

We would be pleased to furnish any information you might need for replacing an existing dome or a new installation.

ASTRO-DOME

PA 000000 050400Z

23 Nov 63 01 40z

FM RUSS

TO RUSSIA 22 02 1700Z

ZNR

R 021700Z

Handwritten: 17/E (UFO) ✓
4xw

FM 341000Z T. EAST AFB NY

TO RUSSIA 22 02 1700Z

RUSSIA 22 02 1700Z FOREIGN TECHNOLOGY DIV WPAFB OHIO

RUSSIA 22 02 1700Z WPAFB OHIO

RUSSIA 22 02 1700Z WPAFB OHIO

INFO RUSSIA 22 02 1700Z WPAFB OHIO

BT

UNCLAS EASNOIN 11-3302

NO 2 AF ATTN: AFCEH. RUSSIA ATTN: AFCEH. SUBJECT: UFO.

THE FOLLOWING INFORMATION IS SUBMITTED IN ACCORDANCE WITH PARAGRAPH 14, APP 213-2. A. DESCRIPTION:

(1) WHITE SMOKE - LIKE STREAK IN SKY WHICH SHATTERED AT ITS END INTO 300-400 BRIGHT RED COLORED

PARTICLES. (2) EACH OF THE 300-400 PARTICLES SIZE OF

BASEBALL AT ARM LENGTH. (3) WHITE STREAK, RED

PARTICLE. (4) ONE STREAK, 300-400 PARTICLES

(5) PARTICLES TRAVELLED THROUGH KY IN "V" FORMATION

PAGE 2 RUSSIA 22 02 1700Z UNCLAS

WITH 2 AF ATTN: AFCEH. RUSSIA ATTN: AFCEH. SUBJECT: UFO.

(1) WHITE SMOKE - LIKE STREAK IN SKY WHICH SHATTERED

AT ITS END INTO 300-400 BRIGHT RED COLORED

PARTICLES. (2) EACH OF THE 300-400 PARTICLES SIZE OF

BASEBALL AT ARM LENGTH. (3) WHITE STREAK, RED

PARTICLE. (4) ONE STREAK, 300-400 PARTICLES

(5) PARTICLES TRAVELLED THROUGH KY IN "V" FORMATION

EXTREMITIES. (6) RESEMBLED SATELLITE OBSERVER HAD
SEEN TWO YEARS AGO. (7) NONE. (8) BULL, PAINT SOUND OF
EXPLOSION WHEN OBJECT SHATTERED. (9) TRAVELLED

AT SPEED WHICH OBSERVER ESTIMATED TO BE TOO FAST
FOR AN AIRCRAFT. F. DESCRIPTION OF COURSE OF OBJECT:

(1) WHITE STREAK IN SKY AND BULL EXPLOSIVE NOISE.
(2) 75 DEGREE ABOVE HORIZON - SOUTH. (3) 15 DEGREE

ABOVE HORIZON - SOUTHEAST. (4) STRAIGHT LINE, END,
BETWEEN HYDE PARK AND POUGHKEEPSIE, NY. (5) DI AP-

PEARED OVER HORIZON. (6) 5 MINUTE. C. MANNER OF
OBSERVATION: (1) GROUND - VISUAL. (2) NONE (3) N/A.

D. TIME AND DATE OF SIGHTING: (1) 180956Z. (2) NIGHT.

E. LOCATION OF OBSERVER: 3 MILES W OF NEW PALTZ, NY.

F. IDENTIFYING INFORMATION OBSERVERS: (1) CIVILIAN:

(A) [REDACTED], AGE 35, [REDACTED],

NY; LABORER, F-6. (B) [REDACTED] AGE-33, [REDACTED]

[REDACTED] T., POUGHKEEPSIE, NY; TRUCK DRIVER, F-6.

(C) [REDACTED] AGE-35, [REDACTED] POUGHKEEPSIE, NY;

LABORER, F-6. (D) [REDACTED] [REDACTED]

PAGE 3 RUZAKN 33 UNCLAS

TR [REDACTED], POUGHKEEPSIE, NY; OCCUPATION UNK F-6.

(E) [REDACTED] AGE-29, [REDACTED] POUGH-

KEEPSIE, NY; LABORER, F-6. (2) N/A. G. WEATHER AND

WIND: (1) CLEAR, NO WIND. (2) SURFACE-112 DEGREE AT

5 KNOT. FOLLOWING WIND. ALOFT ARE ESTIMATE

WINDS AT BY LOCAL W. 0,00FT - 270000FT AT

0,00FT. 12,00FT - 200 DEGREE AT 0,00FT.

0,00FT - 270 DEGREE AT 0,00FT. 0,00FT - 270 DEGREE

0,00FT. 0,00FT - 270 DEGREE AT 0,00FT.

0,00FT - 270 DEGREE AT 0,00FT. 0,00FT - 270 DEGREE

0,00FT - 270 DEGREE AT 0,00FT. 0,00FT - 270 DEGREE

0,00FT - 270 DEGREE AT 0,00FT. 0,00FT - 270 DEGREE

0,00FT - 270 DEGREE AT 0,00FT. 0,00FT - 270 DEGREE

[REDACTED], AGE-35, [REDACTED], T. [REDACTED]
[REDACTED], F-6. (1) [REDACTED], AGE-33, [REDACTED]
[REDACTED], T., POUGHKEEPSIE, NY; TRUCK DRIVER, F-6.
[REDACTED], AGE-35, [REDACTED], T., POUGHKEEPSIE, NY;
LABORER, F-6. (2) [REDACTED], AGE-32, [REDACTED]

PAGE 3 RUCAN 53 UNCL

[REDACTED], POUGHKEEPSIE, NY; OCCUPATION UNK F-6.
(1) [REDACTED], [REDACTED], T. POUCH-

KEEPSIE, NY; LABORER, F-6. (2) N/A. C. WEATHER AND

WINDS: (1) CLEAR, NO WIND. (2) SURFACE-112 DEGREE AT
5 KNOT. FOLLOWING WIND ALOFT ARE ESTIMATED

ARRIVED AT BY LOCAL W/O. 6,000FT - 273 DEGREE AT
10 KNOT. 13,000FT - 263 DEGREE AT 43 KNOT.

6,000FT - 273 DEGREE AT 53 KNOT. 23,000FT - 273 DEGREE
AT 53 KNOT. 33,000FT - 273 DEGREE AT 63 KNOT.

53,000FT - 273 DEGREE AT 65 KNOT. 63,000FT - 273
DEGREE AT 65 KNOT. 83,000FT- NO ESTIMATE AVAILABLE.

(3) CEILING - NONE. (4) VISIBILITY - 7 MILES. (5) AMOUNT
OF CLOUD COVER - HIGH, THIN, SCATTERED. (6) THUNDER-
NONE. (7) VERTICAL TEMP. GRADIENT - UNK.

1. OTHER AIRCRAFT ACTIVITY - NONE KNOWN. 2. AIRCRAFT P-
51 - NONE. 3. AIR TRAFFIC - NONE KNOWN, ACCORDING
TO CHIEF CONTROLLER, HANCOCK FIELD, CT. LALLAN -

4. AIRCRAFT IDENTIFICATION - NONE KNOWN.

5. AIRCRAFT IDENTIFICATION - NONE KNOWN.

6. AIRCRAFT IDENTIFICATION - NONE KNOWN.

NNNN

18 Nov 18/0752Z
MINUT OF THE AIR FORCE
MESSAGE BRANCH
MESSAGE

DOMING

01

AF IN : 35338 (22 Nov 63) C/bfb

PAGE 1 of 3

ACTION: NIN-9

INFO : XOP-1, XOPX-4, DIA-25, DIA-CIIC-2, SAF-OS-3 (45)

SMB C290

ZCHQE498ZCKNA773

RR RUEAHQ

DE RUEAKN 30 22/1706Z

ZNR

R 221705Z

FM 26AIRDIV STEWART AFB NY

TO RUWGALE/ADC

RUCD SQ/AFSC FOREIGN TECHNOLOGY DIV WPAFB OHIO

RUEAHQ/HQ USAF WASH DC

RUEAHQ/SECAF WASH DC

INFO RUEASN/26TH ADIV HANCOCK FLD NY

BT

UNCLAS 26NOIN 11-0002.,

HQ USAF ATTN: AFCIN. SECAF ATTN: SAFOI. SUBJECT: UFO.

THE FOLLOWING INFORMATION IS SUBMITTED IN ACCORDANCE
WITH PARAGRAPH 14, AFR 200-2., A. DESCRIPTION:

- (1) WHITE SMOKE - LIKE STREAK IN SKY WHICH SHATTERED
AT ITS ESE END INTO 300-400 BRIGHT RED COLORED
PARTICLES. (2) EACH OF THE 300-400 PARTICLES SIZE OF
BASEBALL AT ARMS LENGTH. (3) WHITE STREAK, RED
PARTICLES. (4) ONE STREAK, 300-400 PARTICLES
(5) PARTICLES TRAVELLED THROUGH SKY IN "V" FORMATION

PAGE 4 KUEAKH 33 UNCLAS

BASED UPON OBSERVER'S ESTIMATE OF ALTITUDE ("ABOVE
52,000FT"), COLOR OF OBJECT, EXPLOSION AND RESULTANT
SMOKING AND SPEED. L. NONE.

BT

NNNNUPA

3



AF IN : 35338 (22 Nov 63)

PAGE 2 RUEAKN 30 UNCLAS

DEPARTMENT OF THE AIR FORCE
MESSAGE BRANCH
MESSAGE

PAGE 2 of 3

COMING

WITH ARMS OF "V" CURVED TO THE OUTSIDE AT THEIR
EXTREMITIES. (6) RESEMBLED SATELLITE OBSERVER HAD
SEEN TWO YEARS AGO., (7) NONE. (8) DULL, FAINT SOUND OF
EXPLOSION WHEN OBJECT SHATTERED. (9) TRAVELLED
AT SPEED WHICH OBSERVER ESTIMATED TO BE TOO FAST
FOR AN AIRCRAFT. B. DESCRIPTION OF COURSE OF OBJECT:

(1) WHITE STREAK IN SKY AND DULL EXPLOSIVE NOISE.

(2) 75 DEGREES ABOVE HORIZON - SOUTH. (3) 10 DEGREES

ABOVE HORIZON - SOUTHEAST. (4) STRAIGHT LINE, ESE,

BETWEEN HYDE PARK AND POUGHKEEPSIE, NY. (5) DISAP

PEARED OVER HORIZON. (6) 5 MINUTES. C. MANNER OF

OBSERVATION: (1) GROUND - VISUAL. (2) NONE (3) N/A.

D. TIME AND DATE OF SIGHTING: (1) 180950Z. (2) NIGHT.

E. LOCATION OF OBSERVERS: 3 MILES W OF NEW PALTZ, NY.

F. IDENTIFYING INFORMATION OBSERVERS: (1) CIVILIANS:

(A) [REDACTED], AGE 35, [REDACTED], POUGHKEEPSIE,

NY; LABORER, F-6. (B) [REDACTED], AGE-33, [REDACTED]

[REDACTED] ST., POUGHKEEPSIE, NY; TRUCK DRIVER, F-6.,

(C) [REDACTED], AGE-35, [REDACTED], POUGHKEEPSIE, NY;

LABORER, F-6. (D) [REDACTED], AGE-30, [REDACTED]

?
To East for sf ?

AF IN : 35338 (22 Nov 63)

PAGE 3 RUEAKN 30 UNCLAS

SIGHTING

STREET, POUGHKEEPLE, NY; OCCUPATION UNK, F-6.

(E) [REDACTED] AGE-29, [REDACTED] ST. POUGH-

KEEPSIE, NY; LABORER, F-6. (2) N/A. G. WEATHER AND

WINDS: (1) CLEAR, NO WIND. (2) SURFACE-112 DEGREES AT

5 KNOTS. FOLLOWING WINDS ALOFT ARE ESTIMATES

ARRIVED AT BY LOCAL WXO. 6,000FT - 270DEGREES AT

30 KNOTS. 10,000FT - 260 DEGREES AT 40KNOTS.

16,000FT - 270 DEGREES AT 50 KNOTS. 20,000FT - 270 DEGREES

AT 50 KNOTS. 30,000FT - 270 DEGREES AT 60 KNOTS.

50,000FT - 270 DEGREES AT 65 KNOTS. 60,000FT - 270

DEGREES AT 35 KNOTS. 80,000FT- NO ESTIMATE AVAILABLE.

(3) CEILING - NONE. (4) VISIBILITY - 7 MILES. (5) AMOUNT

OF CLOUD COVER - HIGH, THIN,, SCATTERED. (6) THUNDER-

STORMS-NONE. (7) VERTICAL TEMP. GRADEINT - UNK.

H. OTHER UNUSUAL ACTIVITY - NONE KNOWN, I. INTERCEP-

TION - NONE. J. AIR TRAFFIC - NONE KNOWN, ACCORDING

TO CHIEF CONTROLLER, HANCOCK FLD, NY. BALLONS -

NONE. K. STAFF INTELLIGENCE OFFICER, DIRECTORATE

OF INTELLIGENCE, HEADQUARTERS 26TH NORAD/CONAD

REGION. OPINION FORMED IS THAT SIGHTING WAS A METEOR,

BASED UPON OBSERVER'S ESTIMATE OF ALTITUDE ("ABOVE

50,000FT"), COLOR OF OBJECT, EXPLOSION AND RESULTANT

SHATTERING AND SPEED. L. NONE.

BT NOTE: ADVANCE COPY DELIVERED TO DIA & NIN

EQUIPMENT
and SUPPLIES

NEW ASTRO-CAMERA

(Shown with back removed and focusing screen on image magnifier in place.)

COMPARE: A. Uses standard 127 black-and-white or color film. B. Locking cable release for time exposures. C. Threaded tube accepts filters. D. Flexible focusing screen. E. Six-bladed shutter. F. Feather-light — no drag on gears or drive. G. Complete instructions. H. Guaranteed. I. Available for 1 1/4" or 24.5-mm. eyepiece holders. It's easy to produce exciting astrophotos with the AC-1, designed expressly for the amateur. Image magnifier \$2.00 extra.

ASTRO-CAMERA MODEL AC-1 \$39.95



FILTERS

For Observation and Astrophotography
Professionals Use and Recommend Them

BLUE—GREEN—YELLOW—ORANGE—RED—DARK RED
\$3.50 each — Complete set of 6, \$16.00

SUN OR MOON
\$3.50 each — Both, \$5.00

POLAROID
\$5.00

INFRARED OR ULTRAVIOLET — \$10.00 each; Both, \$16.00

Supplied in machined metal holders.

NEW PUBLICATION: FILTERS FOR OBSERVATION AND ASTROPHOTOGRAPHY. Most complete; lists of objects and recommended filters; profusely illustrated; 3rd edition, \$1.95. Delivery in June. Orders placed now, special price of \$1.50.

PUBLICATION CATALOGUE #24 — Over 300 selected astronomical and optical books, maps, etc. ... send 25c

ASTRONOMICAL SPECTROSCOPE #SPEC-11 \$49.95

ASTRONOMICAL SPECTROSCOPY: 256 pages \$3.95

SUN DIAGONAL — Eliminate 95% heat and light \$16.95

CLEANING KIT #1 — Brush, liquid, and tissue ... \$2.00

CONVERTER MODEL #C12A delivers constant household current from standard 12-volt auto battery ... \$19.95

BARLOW — 2x, achromatic, best quality \$13.95

ZOOM EYEPIECE — 21 to 8.4 mm., \$27.95; with Barlow \$37.52

ZOOM EYEPIECE — 25 to 12.5 mm., \$29.95; with Barlow \$39.12



In ordering, specify for 24.5 mm. or 1 1/4" eyepiece holders. SPECIAL PRICES EXPIRE 60 DAYS FROM THIS ISSUE.



write for FREE catalog

OPTICA b/c

3523 MacArthur Boulevard
Oakland 19, California, U.S.A.

OBSERVER'S PAGE

Universal time (UT) is used unless otherwise noted.

MANY OBSERVERS COUNT LEONIDS

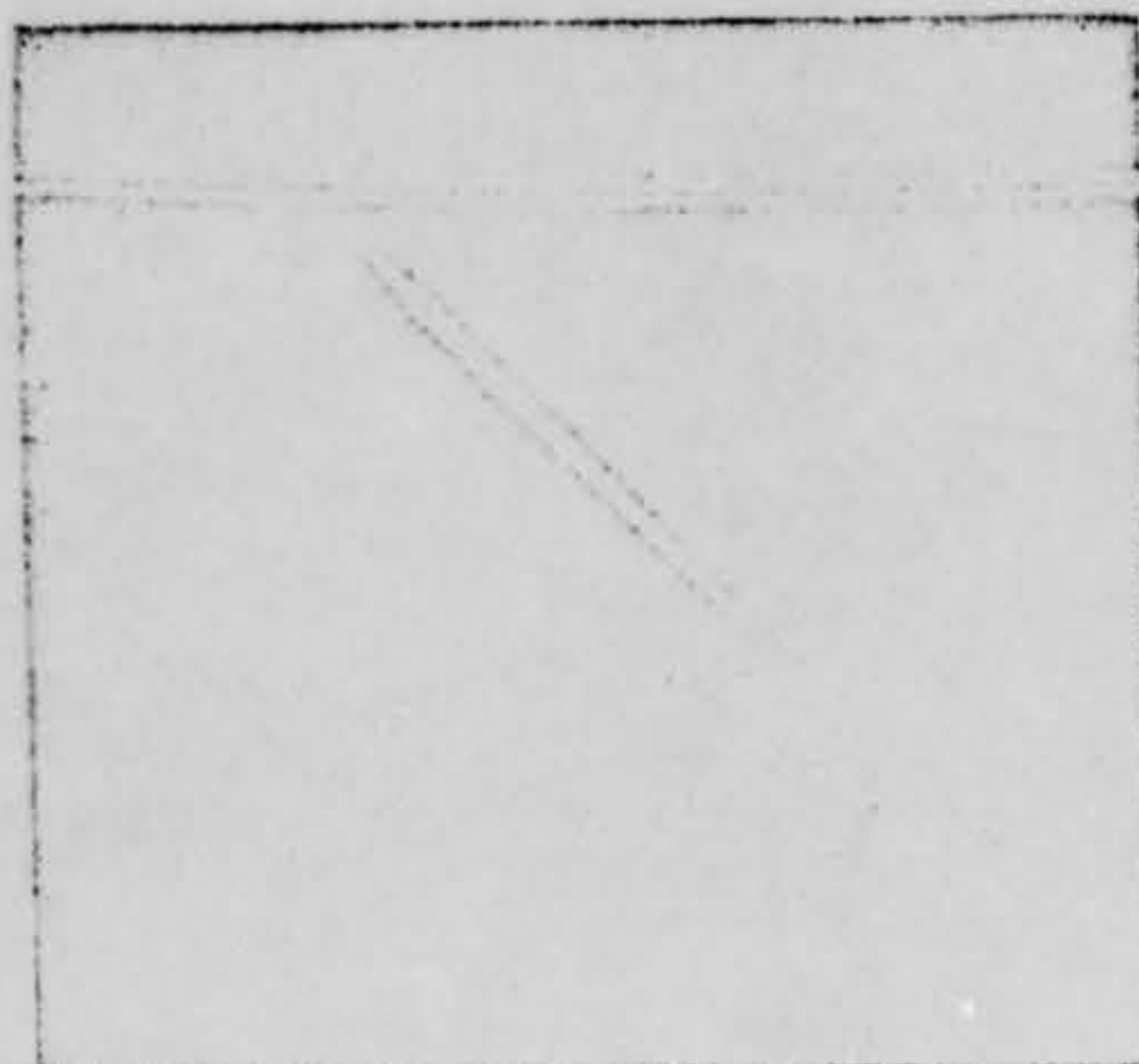
THIS YEAR'S Leonid meteor shower was about as active as the display in 1962 (described in this department last January). Apparently, the maximum occurred on the night of November 16-17, but hourly rates remained below those of 1961 (SKY AND TELESCOPE, February, 1962, page 64).

Most observers agreed that the shower members were strikingly bright, left short trains, and were predominantly white. Ralph Boineau of Columbia, South Carolina, comments, "Almost all the Leonids brighter than 1st magnitude left trains that endured from two to five seconds. The trains from these swift meteors were short, none longer than 20 degrees. All the Leonids I saw were white with just a touch of orange in about half the cases."

As in past years, fireballs were sighted along with other shower members. John Smatko, Yonkers, New York, saw a Leonid fireball "as bright as the quarter moon" through a hole in the clouds 10 degrees west of the radiant. This was at 4:37 a.m. Eastern standard time on November 18th. The meteor left a train that was quickly distorted.

The table lists meteor rates by 17 amateurs who recorded individual counts over specific intervals. Beside each name the observing period is stated in Universal time. *L* is the number of Leonids counted during that interval, *S* the number of sporadic (non-Leonid) meteors. The last column indicates the direction *D* that the observer was facing. All observations were made under reportedly clear skies.

One observer worked on three nights —



On November 17th at 2:24 a.m. Pacific standard time, Robert La Pierre of Whittier, California, photographed this Leonid of magnitude -2. He used a 35-mm. Argus camera set at *f*/3.5 and Plus-X film. He also recorded the Perseid meteor shown on page 299 in the November issue. That picture was incorrectly credited to William Oker, an observing companion.

Observer	Time (UT)	L	S	D
NOVEMBER 15				
Millard	9:00-10:00	6	5	
	10:00-11:00	3	5	
	11:00-11:15	2	3	
NOVEMBER 16				
Millard	9:00-10:00	12	6	
	10:00-11:00	20	9	
	11:00-11:15	5	2	
Morrison	10:45-12:15	7	5	
NOVEMBER 17				
Chapman	9:20-10:20	16	28	NE
	11:30-12:30	23	14	NE
Davis	9:20-10:20	6	7	SE
	11:30-12:30	20	8	SE
Karger	6:20- 7:20	6	3	W
	7:20- 8:20	6	11	W
	8:20- 9:20	7	8	W
	9:20-10:20	14	9	W
Key	7:00- 8:30	13	7	
Larson	9:20-10:20	10	15	N
	11:30-12:30	19	13	S
McCants	7:20- 8:20	7	3	W
	8:20- 9:20	11	7	W
	9:20-10:20	14	5	W
McDonald	9:20-10:20	14	13	NW
	11:30-12:30	16	14	NW
McLean	9:20-10:20	11	10	S
	11:30-12:30	29	11	N
Meeus	0:18- 1:03	0	2	E
Millard	9:00-10:00	5	4	
	10:00-11:00	15	4	
	11:00-11:15	6	1	
Milon	9:20-10:20	7	12	E
	11:30-12:30	30	11	E
Molinaire	6:20- 7:20	2	4	E
	7:20- 8:20	3	13	E
	8:20- 9:20	10	3	E
	9:20-10:20	7	4	E
Morrison	11:00-13:30	14	9	
Russell	6:20- 7:20	7	23	E
	7:20- 8:20	5	14	E
	8:20- 9:20	19	4	E
	9:20-10:20	18	9	E
Sears	9:20-10:20	9	10	SW
	11:30-12:30	20	14	SW
Souther	6:20- 7:20	2	7	W
Thomson	6:20- 7:20	3	9	S
	7:20- 8:20	1	10	S
	8:20- 9:20	7	4	S
	9:20-10:20	4	5	S

J. Millard at Atlanta, Georgia. J. Meeus is in Kessel-Lo, Belgium. L. Key at Fernandina Beach, Florida, and R. Morrison in Los Angeles, California.

Two teams of observers supplied the bulk of the meteor counts. C. Chapman, D. Davis, J. Fountain (timekeeper), S. Larson, L. McDonald, D. McLean, D. Milon, and W. Sears watched from Kitt Peak, Arizona. At Montgomery, Texas, another group consisted of Karger, M. McCants, B. Molinaire, Russell, and K. Thomson; Souther kept time during most of the observing session.

On the morning of November 16th, between 2:30 and 4:00 a.m., Central standard time, Randy Baldwin, Wayne